GD2S02 – Software Engineering for Games

Design Documents

Game Design/Requirements Document

- Game Design Document
  - What is it?
  - Do you REALLY need one?
  - What do I need before I begin?
  - How should I begin?
  - What should it contain?
  - What style of game design?
  - Any examples?
- Requirements Document
  - Similar, different headings

Game Design Document

- What is it?
  - A game design document is a collection of data, ideas and story that a team can use to create a game.
  - It is a tool for selling the game idea to management, publishers and teams.
  - A clear guide for others to understand complex gameplay ideas.
  - A way to convey those messages.
  - It is a container for visions.

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Requirements Document

- What is it?
  - A **requirements** document is a collection of data, ideas and story that a team can use to create a **solution.**
  - It is a tool for selling the **solution** idea to management, **sponsors** and teams.
  - A clear guide for others to understand complex **solution specific** ideas.
  - A way to convey those messages.
  - It is a container for visions.

Do you REALLY need one?

- Yes!
- Regardless if it is used by anyone else on the team or not.
- It is used to organise your thoughts.
- It is a touchstone for the process of development.
- It is a tool to sell your ideas.
- Not always a complete document.
- No professional company will make the game/solution without this document.
- This is only the first of several documents that will need to be made.

What do I need before I begin?

- Communication skills
- Writing skills
- Programming or scripting skills
- Art skills
- Presentation skills
- Analytical thinking skills
- Time management skills
- Leadership skills

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What ELSE?

- I love to read.
- Watch movies.
- I listen to all kinds of music.
- I play all kinds of games.
- I enjoy history.
- I am up on the latest technology.
- I am willing to listen.
- I am willing to learn.
- I write down all my ideas.
- I can take criticism.

How should I begin?

- Concept Document
  - This solidifies the ideas into concise bits that can be used to sell the ideas to others.
  - Useful for elevator pitches.
  - Usually used internally at game/development studios.
  - Around 2 pages.

How should I begin?

- **Game Treatment Document**
  - – This gives a broader picture of the game.
  - – This gives decision makers more information.
  - – Used to get more funding to develop further from publisher/sponsor.

How should I begin?

- Game Design Document
  - Full documentation.
  - Big budget games usually 50 to 300 or more pages.
  - Describes the game in great detail.
  - Roadmap of where the game should go.
  - Blueprint of how to get there.
- Requirements Document
  - Similar to GDD in size.
  - Details what will be delivered by the project.
  - Describes the ‘what’, but not ‘how’.

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GDD: What should it contain?

- Each one is different and has different needs.
- No standard and many ways to do it.
- Read successful GDD’s to see what worked for them.
- Keep it updated with any design changes.

GDD: What should it contain?

- Some rules of thumb
  - Most of your game design should be in prose.
  - Describe interactive experiences not stage direct
    - Describe optimal paths
    - Expect the player to do something else
  - Describe not just list
  - Use graphics to enhance the description
    - Tables
    - Pictures
    - Flow charts
    - Charts

Requirements: What should it contain?

- Similar to GDD…
- Detailed enough to build test plans from.
- Explains any jargon used.
- Business rules are described.
- Includes user interface (/usability) design.
- Written record of requirements conversations.
- Forms part of finished system documentation.
- So keep it up to date as/when there are changes.

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Game Design Document - Headings

- Story
- Environments
- Script
- Player Character
- Abilities
- Non-Player Characters
- Features
- Gameplay Mechanics
- Level / Scene Descriptions
- User Interface

Which apply to Requirements Documents?

Other things to keep in mind

- Games should be easy to learn, difficult to master
  - However, business solutions should be easy to learn **and** easy to master.
- Games should be fair, intuitive, fun and accessible.
- The user interface should be consistent with standard usage.
- Balance user friendly with control.
- Design for your audience.
- Quality not quantity.

Other things to keep in mind

- Use the inverted pyramid!
- Communicate clearly.
- Spelling, punctuation and grammar count.
- Pictures are worth a thousand words.
- All rules are made to be broken.
- Write an elevator pitch to start with.

What style of game design?

- Copycat
- Experience
- Narrative
- World
- Systems
- Player skills

What style of requirements?

- High level
- Detailed
- Includes UI, or not?
- Flowcharts
- Business process description
- Testing strategy
- Implementation strategy

Things to consider in a commercial situation

- Who does it appeal to?
- Are there other games like it?
- How did those games fair financially?
- What is the market saturation?
- What genre?
- What camera angle?
- What networking?
- How does the UI look like?
- How does the AI perform?

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Things to consider in a commercial situation

- What is the scope?
- How long will it take?
- How many people?
- Has the game been scheduled?
- Is there a QA plan?
- What are the milestones?
- What are the deliverables each milestone?
- What are the known risks?
- Are there contingency plans?
- Etc…

Things to consider in a commercial situation

- Correct
- Feasible (realistic, possible)
- Necessary
- Prioritised
- Unambiguous
- Verifiable (Testable)
- Complete
- Consistent
- Modifiable
- Traceable

TECHNICAL DESIGN DOCUMENTS

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System Design

Design is defined in [IEEE610.12-90] as:

> “The process of defining the architecture, components, interfaces, and other characteristics of a system or component.”…

> “Describing each component sufficiently to allow for its construction.”

Technical Design Documents

- Records **decisions** on how to implement in the design document.
- The ‘how’.
- Should provide enough information for:
  - A developer to begin an implementation from.
  - A test analyst to construct a test plan.
  - Another developer to plan to interface with, even before the implementation is done.

The Technical Design Document

What is the purpose of a design document?

“To communicate to others what your design decisions are any why your decisions are good decisions.”

“To force you to think through your design logically.”

“To enable peer review, management review, and provide a common vocabulary to discuss the project.”

“To record decisions that have been taken.”

What are the major components of a TDD

- Executive Summary
- Project Summary
  - Target Platforms
  - Key Technical Challenges
  - Goals
  - Constraints
- Architecture
  - Overview
  - Key Algorithms

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Technical Design Document

- Artificial Intelligence
  - Behaviors
  - Path Finding
- Physics
- Input / Output
  - Media
  - Streaming
- Hardware Considerations

Technical Design Document

- Multiplayer
  - Local
  - LAN
  - Internet
- Graphics
  - 3d Pipeline
  - Art Tools
  - User Interface
- Sound

Technical Design Document

- Localisation
- Research and Development
- Coding Standards
- Game Engine
- Risks
  - Contingencies
  - Scalability
- Security

Technical Design Document

- Identify tools required for development.
- Description of middleware:
  - Justify (reason for using will be forgotten in time, so good to record).
  - Benefits.
- Coding standards.
- Version control practises.
- Asset naming conventions.
- Data sources and file formats.
- Memory management in game.

IEEE Key Issues in Software Design

- Concurrency.
- Control and Handling of Events.
- Distribution of Components.
- Error and Exception Handling and Fault Tolerance.
- Interaction and Presentation.
- Data Persistence.